EVENT SUMMARY

THE ROLE OF THE UK GOVERNMENT IN SUPPORTING INTERDISCIPLINARY RESEARCH

A ROUNDTABLE CO-HOSTED BY THE PHYSIOLOGICAL SOCIETY AND THE CAMPAIGN FOR SCIENCE AND ENGINEERING JANUARY 2021

SUMMARY

- Interdisciplinary research is crucial to solving challenges of the present and the future.
- Challenges facing interdisciplinary research include lack of visibility in career opportunities and access to funding.
- The Research Excellence Framework is an important tool for measuring the impact of interdisciplinary research, which can also help to highlight high-quality interdisciplinary work.
- Challenge-based and mission-based funding streams can greatly support interdisciplinary research.
- Greater support should be given at the fringes of 'traditional' research disciplines to encourage cross-disciplinary research.

Foreword from The Physiological Society

Physiology is the science of reassembly at the molecular, cellular, tissue and systems level, and therefore provides a framework for the rules of life. It is also provides a bridge between discovery science and translational medicine, and an interface between physical and life sciences. Physiology by its nature, is a quintessential interdisciplinary science.

Over the past few months we have all witnessed the vital contribution of physiological research in responding to the COVID-19 pandemic: from understanding how this novel disease affects multiple organs in the body, through to developing effective treatments. Longer term, the Government's commitment in its Industrial Strategy Grand Challenge to improving health in older age will require intense focus on the physiological processes underpinning ageing.

Therefore, for the Government to meet both its immediate and long-term health priorities, it is imperative that the UK research funding system supports interdisciplinary research.

It was a real pleasure, along with my colleague Dr Lucy Green, to be able to join other experts at this roundtable. It was clear from the discussions that while interdisciplinary research is passionately advocated for across the sector, barriers exist at the intersection of research disciplines.

This chimed with our 2019 report 'Growing Older, Better', which explored the contribution that physiology could make to the UK Government's 'Ageing Society' Grand Challenge. During that project we identified that current grant funding applications often put barriers in place that disincentivise interdisciplinary research, and that systems within academia often promote expertise in a narrow area.

As demonstrated at this roundtable, these challenges are not unique to physiology. All aspects of interdisciplinary research face common difficulties. As we have seen throughout history, it is often the case that the greatest discoveries take place on the fringes of disciplines. As the post-Brexit UK looks to sustain and advance its position as a science power, it should place interdisciplinary research front and centre by ensuring the funding system champions collaboration, diversity, and innovation. With the planned significant increase in R&D funding, the fledgling UKRI and the planned review of the Research Excellence Framework, we have a unique opportunity to shape the UK's research funding landscape for decades to come.

Professor David Paterson
President, The Physiological Society

Foreword from the Campaign for Science and Engineering

The UK is at the outset of an 'R&D Decade' which will see research and innovation become a more significant part of the UK's economy and culture. This agenda is being driven by Government, with substantial investment of public money committed over the next few years. In order to be a success, the R&D Decade needs to enable people across UK society to participate in and benefit from a more research-intensive economy. In other words, it must deliver meaningfully on the issues that face society – and this requires an interdisciplinary approach.

The UK's research base has a unique asset, which is its strength in breadth. The UK is notable for its excellence across all disciplines. This gives the UK a powerful platform from which to respond in an agile way to challenges, deploying novel combinations of disciplines to tackle the issues of the day.

Interdisciplinarity, therefore, is key to delivering impact and value to society from the new ideas generated by research and innovation, and is something the UK is uniquely positioned to do well. Understanding the importance of interdisciplinary research and its role in addressing some of the world's greatest challenges is crucial to tackling issues such as pandemics, climate change, food security and more.

Challenge and mission-led approaches have been given greater emphasis by Government in recent years, backed by funding. Now, we need to ensure that incentives, rewards and structures are in place to encourage and sustain interdisciplinarity in practice. Support for interdisciplinarity is required to ensure the widest possible impact and benefit of research and innovation is realised.

Dr Sarah Main
Executive Director, The Campaign for Science and Engineering

ROUNDTABLE SUMMARY

Challenges

One of the first issues highlighted in the discussion was the terminology of different types of research. It was suggested that using the term 'interdisciplinary' when referring to particular research programmes can mean that this research is viewed separately from 'traditional' academic disciplines. In fact much research is inherently interdisciplinary. For example, astronomy requires engineering to build telescopes and computing to analyse data, as well as 'traditional' astronomy.

This problem of perception and image related to the term 'interdisciplinary' can lead to barriers. 'Traditional' single disciplines are often considered more important and prestigious within academia. This can also lead to concerns over career progression for those who work in interdisciplinary fields over those who choose to specialise as career paths can be less well defined in emerging areas of research. There are also issues over the quality and number of journals and publishers available to publish interdisciplinary research than individual research disciplines. While many of the most high profile journals, such as Nature and Science, are interdisciplinary many less high profile journals are not.

Another challenge raised was around the availability of funding for interdisciplinary research. It was said that there are fewer funding schemes available to support interdisciplinary research and it is sometimes perceived that interdisciplinary research is 'higher risk'. While well-established researchers are often willing to take on this risk, early career researcher are not for fear of jeopardising their future careers. This aspect of 'higher risk' may be because it is harder to get multiple sets of referees with a breadth of requisite knowledge to agree to the terms of research funding, an issue that would need to be addressed even in the event of greater availability of funding for interdisciplinary research.

Having the forums and opportunities for individuals to come together and work in a cross-disciplinary way was said to be very important in increasing interdisciplinary research. It is clear that without having a strong cross-section of ideas and expertise, it is difficult to approach problems in an interdisciplinary way. These difficulties may often be exacerbated by the physical infrastructure of organisations who have separate buildings for different research disciplines, meaning people are far less likely to see and interact with those outside of their discipline. Supporting more interdisciplinary research will need strong leadership and ambition in bringing people together to solve some of the world's greatest challenges.

It was said that in areas funded by UKRI challenge funds, there is probably a greater amount of research being carried out in an interdisciplinary way than in the past. In attempting to bring people together, it was felt that challenge-led funds have helped. However, the size and value of interdisciplinary research grants tend to be much larger in order to support the large number of people required to work on the research. This means that these grant opportunities can exclude smaller research partnerships.

Measuring the impact of interdisciplinary research

The primary way that the impact of academic research is measured is through the Research Excellence Framework (REF). Previous iterations of the REF, the last of which took place in 2014, showed that work of an interdisciplinary nature was on average given similar ratings to discipline-specific research. However, the perception that interdisciplinary research is scored lower in REF exercises meant that fewer interdisciplinary cases were submitted. With the current iteration of the REF due to be completed this year, Research England will be continuing to find new ways of integrating interdisciplinary research within the REF. The Stern Review, an independent review of the REF conducted in 2016, made a series of recommendations to support interdisciplinary research within the REF. The review was welcomed for advocating more expansive thinking about how to attract greater interdisciplinary research which can help to solve some of the greatest societal challenges. It was also said that the Review encouraged individuals to feel confident to say that their work is multi-disciplinary and not feel like it is secondary to discipline-specific work.

The Knowledge Exchange Framework (KEF) is also a very important metric in measuring impact of research. Knowledge exchange was seen to be a powerful way of bringing more people together in order to approach problems in a multi-disciplinary way, which was one of the barriers to success mentioned earlier in the discussion.

Role of Government in supporting interdisciplinary research

The main way that Government can support interdisciplinary research is through funding schemes. It was said that the funding landscape for interdisciplinary research was stronger now than in the past and helps to bring large multidisciplinary research teams together. It was felt that a greater emphasis on social and economic impacts of research can drive great scientific progress but also foster greater collaboration between disciplines.

One such scheme which was deemed to be very effective in building cross-disciplinary consortia is the Global Challenges Research Fund (GCRF). This is due to the fact that the GCRF has not only been able to support research in the UK but also help to build equitable partnerships between researchers in the UK and across the world. The GCRF has also supported the UK's efforts towards the United Nations Sustainable Development Goals, driving research and partnership development.

It was felt that these mission-based funding schemes are a powerful way of supporting all types of research and innovation. Despite being framed around solving particular challenges or having a particular outcome, these results cannot be achieved without strong discovery research.

It was felt that the agility seen during the current pandemic with regards to the delivery and flexibility of funding for research could be retained and be of great benefit to the research base. It was also agreed that in order to support a greater degree of interdisciplinary research, using big data and data sharing is a vital tool in supporting missions-based research. UKRI have acknowledged their role in championing open science and data sharing where that has not always been the case.

Conclusions

In concluding, it was felt that a breadth of funding opportunities in a mixture of bottom-up and top-down funds were crucial in supporting interdisciplinary research. This breadth can help meet some of the greatest challenges facing society while helping to build on the strength of the UK's research base. It will be increasingly important that organisations undertaking research, particularly universities, can support research at the fringes of traditional research disciplines and give strong leadership to develop current and future generations of scientists and researchers to work in a cross-disciplinary way.

This event summary is taken from the roundtable held on 20th January 2021, co-organised by The Physiological Society and the Campaign for Science and Engineering (CaSE)

This unattributed summary does not represent policy positions of either The Physiological Society or CaSE but will form part of our ongoing programme of work to support the development of the R&D roadmap, ultimately enhancing the environment for science and engineering in the UK.

About The Physiological Society

The Physiological Society brings together over 4000 scientists from over 60 countries. Since its foundation in 1876, its members have made significant contributions to our knowledge of biological systems and the treatment of disease. We promote physiology and support those working in the field by organising world-class scientific meetings, offering grants for research, collaboration and international travel, and by publishing the latest developments in our leading scientific journals.

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About the Campaign for Science and Engineering

The Campaign for Science and Engineering (CaSE) is the UK's leading independent advocate for science and engineering. Our mission is to ensure that the UK has the skills, funding and policies to enable science and engineering thrive. We represent over 115 scientific organisations including businesses, universities, professional bodies, and research charities as well as individual scientists and engineers. Collectively our members employ over 341,000 people in the UK, and our industry and charity members invest around £29bn a year globally in R&D. We are funded entirely by our members and receive no funding from government.

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